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| Titolo | Lattice Models for Fluctuating Hydrodynamics in Granular and Active Matter / / by Alessandro Manacorda |
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| Descrizione fisica | 1 online resource (XIX, 200 p. 47 illus., 15 illus. in color.) |
| Collana | Springer Theses, Recognizing Outstanding Ph.D. Research, , 2190-5053 |
| Disciplina | 532.5 |
| Soggetti | Statistical physics<br>Amorphous substances<br>Complex fluids<br>Thermodynamics<br>Statistical Physics and Dynamical Systems<br>Soft and Granular Matter, Complex Fluids and Microfluidics |
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| Nota di contenuto | Part I: Granular and Active Matter -- Granular Matter -- Active Matter -- Hydrodynamic Description and Lattice Models -- Part II: Fluctuating Hydrodynamics of Granular and Active Matter: Lattice Models -- Granular Lattice: Fluctuating Hydrodynamics -- Granular Lattice: Beyond Molecular Chaos -- Active Lattice Fluctuating Hydrodynamics -- Conclusions. |
| Sommario/riassunto | This book investigates the common nature of granular and active systems, which is rooted in their intrinsic out-of-equilibrium behavior, with the aim of finding minimal models able to reproduce and predict the complex collective behavior observed in experiments and simulations. Granular and active matter are among the most studied systems in out-of-equilibrium statistical physics. The book guides readers through the derivation of a fluctuating hydrodynamic description of granular and active matter by means of controlled and transparent mathematical assumptions made on a lattice model. It also shows how a macroscopic description can be provided from |

microscopic requirements, leading to the prediction of collective states such as cooling, swarming, clustering and the transitions among them. The analytical and numerical results shed new light on the physical connection between the local, microscopic properties of few particles and the macroscopic collective motion of the whole system.